

BellSouth Corporation
Suite 900
1133-21st Street, N.W.
Washington, D.C. 20036-3351

karen.possner@bellsouth.com

Karen B. Possner
Vice President-Strategic Policy

202 463-4160
Fax 202 463-4637

May 18, 2001

Electronically Filed

Ms. Magalie Roman Salas
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: *Establishment of Rules and Policies for the Satellite Digital Audio Radio Service in the 2310-2360 MHz Band* – IB Docket No. 95-91
WRITTEN EX PARTE PRESENTATION

Dear Ms. Salas:

I am writing on behalf of BellSouth Corporation and BellSouth Wireless Cable, Inc. (collectively, "BellSouth") to respond to recent filings by XM Radio, Inc. ("XM") and Sirius Satellite Radio, Inc. ("Sirius") proposing specific rules to govern deployment by Satellite Digital Audio Radio Service ("SDARS") licensees of terrestrial repeaters.¹ As the licensee of Wireless Communications Service ("WCS") spectrum that is adjacent to the spectrum allocated for SDARS, BellSouth previously has expressed its concern over potential interference from SDARS terrestrial repeaters.² The rules proposed by XM and Sirius do nothing to alleviate those concerns – to the contrary, they evidence an intent by XM and Sirius to run roughshod over the WCS industry. BellSouth must emphasize that it does not oppose the deployment of terrestrial SDARS repeaters to fill

¹ Letter from Bruce D. Jacobs to Magalie Roman Salas, IB Docket No. 95-91 (dated April 25, 2001)[the "XM Letter"]; Letter from Carl R. Frank to Magalie Roman Salas, IB Docket No. 95-91 (dated April 23, 2001)[the "Sirius Letter"].

² Those concerns have been expressed both in *ex parte* meetings and in formal filings in this docket. See, e.g., Comments of BellSouth, IB Docket No. 95-91 (filed Feb. 22, 2000)[“BellSouth Comments”]; Letter from Paul J. Sinderbrand to Magalie Roman Salas, IB Docket No. 95-91 (filed Jan. 12, 2001); Letter from Karen B. Possner, *et al* to Magalie Roman Salas, IB Docket No. 95-91 (filed Jan. 25, 2001); Letter from William M. Wiltshire to Magalie Roman Salas, IB Docket No. 95-91 (filed Feb. 6, 2001);); Letter from Karen B. Possner to Magalie Roman Salas, IB Docket No. 95-91 (filed March 8, 2001). In addition, BellSouth is a member of, and has coordinated closely with, the Wireless Communications Association International, Inc. ("WCA"), which has submitted its own filings echoing BellSouth's concerns. See Letter from Paul J. Sinderbrand to Magalie Roman Salas, IB Docket No. 95-91 (filed Dec. 15, 2000).

gaps in satellite coverage.³ What concerns BellSouth is that the rules proposed by XM and Sirius would allow the operation of terrestrial SDARS repeaters in a manner that substantially interferes with the ability of BellSouth and other WCS licensees to serve the public.

Although the notion that SDARS licensees would operate terrestrial repeaters is not new, adoption of the rules proposed by XM and Sirius would transmogrify SDARS from a satellite service with a terrestrial adjunct, into a service that is primarily terrestrial in nature. When the Commission first contemplated the idea of permitting SDARS licensees to operate terrestrial repeaters, those devices were described as “gap-fillers” designed to serve discrete areas like “urban canyons.”⁴ Only after the close of the WCS auction did the SDARS licensees disclose that, rather than carefully designing repeaters to fill isolated gaps in coverage, they hoped to impose a “brute force” solution on the problem of satellite coverage gaps.⁵ Over time, it has become increasingly evident that XM and Sirius do not intend to rely on satellite reception anywhere in urban markets, but rather intend to blanket those markets with terrestrial signals from extremely high-power repeaters (some with EIRPs as great as 40 kW) such that terrestrial signals will be ubiquitous.⁶ Indeed, as discussed in more detail below, even within the past eighteen months, the SDARS deployment plans have continued to migrate towards the use of more, higher-power boosters. When the Commission first proposed service rules for SDARS, it questioned “whether, if a large number of gap fillers is required, there comes a point at which the service becomes essentially a terrestrial rather than a satellite service.”⁷ That appears to be exactly what is occurring here.

BellSouth is ambivalent as to whether the SDARS licensees utilize terrestrial or satellite technology to serve urban subscribers – its interest in this proceeding derives from the fact that Sirius and XM are proposing to utilize high-power terrestrial technology that would have a significant adverse effect on WCS. The issue here is not

³ It is worth noting that BellSouth does not compete against SDARS licensees and therefore has no reason to oppose their plans other than to protect BellSouth’s future WCS operations from interference.

⁴ See *Establishment of Rules and Policies for the Digital Audio Radio Satellite Service in the 2310-2360 MHz Frequency Band*, 11 FCC Rcd 1, 18 (1995)[the “SDARS NPRM”]; *Establishment of Rules and Policies for the Digital Audio Radio Satellite Service in the 2310-2360 MHz Frequency Band*, 12 FCC Rcd 5754, 5810 (1997).

⁵ The auction of WCS spectrum was held from April 15-25, 1997. The first time any information was filed with the Commission giving any specifics regarding the technical parameters for SDARS terrestrial repeaters was November 1997.

⁶ Indeed, the information that has been provided regarding terrestrial DARS repeaters in the Atlanta, Boston and San Francisco markets shows that the transmission antenna systems will provide very broad coverage, rather than utilize the spot beams that one would expect from facilities designed to fill in isolated gaps.

⁷ *SDARS NPRM*, 11 FCC Rcd at 18.

whether SDARS licensees should be permitted to deploy terrestrial repeaters, but rather what obligations should be imposed on the design and deployment of those repeaters to protect other services from interference. So that there is no confusion, the Commission should recognize that BellSouth has no objection to the deployment, without any prior coordination, of as many terrestrial repeaters as are necessary to provide adequate SDARS coverage, so long as those repeaters comport with two basic requirements:

- To avoid interference due to out-of-band emissions, the spectral mask should limit out-of-band emissions generated by SDARS terrestrial repeaters to no more than $75 + 10 \log(p)$ dB less than the transmitter EIRP (p being the EIRP in watts).
- To avoid blanketing interference to nearby WCS receivers, the EIRP of every SDARS repeater should be limited to no more than 400 W/MHz.

BellSouth hopes that adoption of a spectral mask requiring out-of-band emissions to be attenuated to at least $75 + 10 \log(p)$ less than the transmitter EIRP will be acceptable to XM and Sirius. Both have previously represented to the Commission they will meet this mask,⁸ yet neither included the spectral mask in its proposed rules. Presumably, this is merely an oversight the Commission can correct when it adopts final rules. Although the SDARS-proposed mask is less stringent than the $80 + 10 \log(p)$ limitation imposed on WCS licensees to protect SDARS,⁹ and less stringent than that initially proposed by BellSouth,¹⁰ BellSouth is willing to accept the SDARS proposal in the spirit of compromise.¹¹

The one remaining substantial area of disagreement between the WCS community and the SDARS licensees involves the appropriate power level for terrestrial DARS repeaters. Significantly, the SDARS licensees do not dispute that they could provide service solely using standard-power repeaters (those operating at no more than 400 W/MHz). Indeed, in meetings with Commission staff, they have conceded that they can provide the same level of service to consumers using standard-power repeaters as they can using the high-power approach they advocate. Although it has been suggested that adoption of a 400 W/MHz limitation will impose some additional costs on SDARS

⁸ See Supplemental Comments of Sirius, IB Docket No. 95-91, at Exhibit 1 p. 2 (filed Jan. 18, 2001)[“Sirius January 18, 2001 Supplement”]; Supplemental Comments of XM, IB Docket No. 95-91, App. A p. 5 (filed Dec. 17, 1999)[“XM December 17, 1999 Supplement”].

⁹ See 47 C.F.R. § 27.53.

¹⁰ See BellSouth Comments, at 7-10.

¹¹ AT&T Wireless Services, Inc. (“ATTWS”) has also evidenced its willingness to accept this mask. See Letter from William M. Wiltshire and Karen M. Gulick to Magalie Roman Salas, IB Docket No. 95-91, at 8 (filed April 30, 2001)[“ATTWS Proposal”].

licensees, those additional costs are relatively small.¹² Moreover, they certainly were foreseeable at the time XM and Sirius entered the SDARS arena and thus should have been factored into their business plans. The Commission should reject the attempt by XM and Sirius to shift to the WCS community their costs of deploying a non-interfering terrestrial network.

It is important for the Commission to recognize that the SDARS licensees cannot legitimately claim that adoption of a 400 W/MHz EIRP limit would be inconsistent with their reasonable expectations at the time of the SDARS auction. When the WCS auction was held in April 1997, auction participants had every reason to believe that, although the Commission had not adopted rules governing SDARS terrestrial repeaters, those rules would ultimately protect WCS operations from interference. Certainly, there was nothing either in the *Report and Order* or the *Memorandum Opinion and Order* in Gen. Docket No. 96-228 or in the *FNPRM* in IB Docket No. 95-91 suggesting that WCS would be a secondary service relative to SDARS terrestrial repeaters.¹³ Similarly, when the SDARS auction closed that same month, SDARS auction participants reasonably should have anticipated that the Commission would restrict the power level of terrestrial repeaters. Significantly, just prior to the SDARS auction, the Commission adopted WCS rules specifically limiting WCS EIRP to 400 W/MHz to protect operations at 2.1 GHz and 2.5 GHz, which also operate with the same power restriction, from interference. Thus, in April 1997, it was reasonable for WCS licensees to believe that a similar restriction would be imposed on SDARS terrestrial repeaters to protect WCS and other services in the same region of the spectrum.¹⁴ XM has conceded that 400 W/MHz is “a power level [that] is completely standard in this part of the spectrum.”¹⁵ As such, XM and Sirius should have anticipated at the time of the SDARS auction that the Commission might settle on that limit for terrestrial SDARS repeaters.

¹² See Consolidated Reply of XM Radio, IB Docket No. 95-91, at 13-14 (filed March 8, 2000) (predicting an increase of \$45 million in costs were the Commission to impose a 400 W/MHz EIRP limitation on SDARS repeaters). Given XM’s estimate, reported in various filings with the Securities and Exchange Commission, that it will spend over \$1.1 billion to deploy its service, this increase in terrestrial costs – representing less than 5% of the total cost of inaugurating service – is not material. Moreover, it should be noted that those predicted increased costs have never been quantified and neither BellSouth nor the Commission is in a position to judge whether XM’s prediction overstates its case.

¹³ See *Amendment of the Commission’s Rules to Establish Part 27, the Wireless Communications Service (“WCS”)*, 12 FCC Rcd 10785 (1997); *Amendment of the Commission’s Rules to Establish Part 27, the Wireless Communications Service (“WCS”)*, 12 FCC Rcd 3977 (1997) [“WCS Reconsideration Order”].

¹⁴ See *WCS Reconsideration Order*, 12 FCC Rcd at 3990-94.

¹⁵ XM Letter at 2.

Nor can the SDARS licensees seriously dispute that adoption of a 400 W/MHz limit will reduce blanketing interference to WCS.¹⁶ The need for the proposed 400 W/MHz limitation of terrestrial repeater EIRP has been well established in the record. Because BellSouth has not yet chosen the applications it will provide over WCS or the technology it will employ, BellSouth cannot provide a specific analysis of the impact deployment of high-power SDARS terrestrial facilities will have.¹⁷ Previously, however, BellSouth provided the Commission with preliminary information regarding the subscriber units it is likely to deploy,¹⁸ and regardless of the applications and technology ultimately chosen by BellSouth, it does not appear today that the impact of terrestrial DARS repeaters will materially differ from that recently reported by ATTWS. The ATTWS studies, which examine the planned SDARS terrestrial deployment in Atlanta, show that blanketing interference would preclude WCS service to between 171,000 (if repeaters were operated at levels proposed by XM and Sirius in their “non-binding” submissions) and 435,000 households (if repeaters were operated at maximum power permitted under the XM and Sirius rule proposals). Most significantly, ATTWS concludes that “by replacing their proposed high power repeaters with multiple standard power (2 kW) repeaters, the SDARS licensees could achieve the same coverage for their own service but reduce the size of the exclusion zone in Atlanta by 141 km², or 43.2%.”¹⁹ This analysis has not been refuted.

ATTWS’s analysis should put an end to the baseless notion, advocated primarily by counsel for Sirius (albeit without supporting engineering analysis), that WCS licensees actually benefit from high-power repeaters and should prefer the deployment of those

¹⁶ It should be noted that even adoption of BellSouth’s proposal will not entirely eliminate blanketing interference. However, it will reduce that interference to more manageable levels that are consistent with the reasonable expectations BellSouth had at the time of the WCS auction. As is discussed in the accompanying Engineering Statement of George Harter [the “Harter Statement”], analyses conducted for BellSouth based on vendor data suggest that the required separation distance between an SDARS terrestrial repeater and a WCS subscriber unit will be on the order of four times greater for a 40 kW repeater compared to a 2 kW repeater.

¹⁷ BellSouth did conduct a 6-month trial of WCS technology in Houma, LA last year. Because this system was not located in a geographic area for which information is available regarding SDARS terrestrial deployment, BellSouth cannot provide specific analysis of any impact terrestrial repeaters had on the technology utilized in the trial. Given the limited nature of WCS deployment to date, the argument by Sirius that “WCS providers have not experienced any interference even though Sirius’ terrestrial repeaters have been tested in various cities for several months now” is of no merit. Sirius has not disclosed the location or technical parameters of the terrestrial facilities it has tested, nor has Sirius disclosed the time and duration of testing. Thus, if there has been any overlap, it cannot be discounted that interference has occurred but was too intermittent to be traced to Sirius’ testing.

¹⁸ See Memorandum to Ron Repasi from John Tehan (dated March 8, 2001), filed as an attachment to Letter from Karen B. Possner to Magalie Roman Salas, IB Docket No. 95-91 (dated March 8, 2001)[“Tehan Memorandum”].

¹⁹ ATTWS Proposal at 2.

facilities as compared to the use of standard repeaters.²⁰ BellSouth has commissioned a separate study that confirms the results reported by ATTWS.²¹ The fact that not one WCS licensee agrees with Sirius or supports the deployment of high-power repeaters under the SDARS-proposed rules is telling.²²

Similarly, the time has come to dismiss Sirius' unfounded assertion that the WCS community is planning to employ "technically inferior receivers susceptible to all neighboring interference."²³ To the contrary, all of the equipment that BellSouth is evaluating has been carefully designed to operate in an environment in which adjacent services utilize a reasonable power level – no more than the 400 W/MHz EIRP limitation that XM acknowledges is "standard" in this band. In fact, given that BellSouth previously has provided the Commission a block diagram specifically showing the use of filtering in its subscriber units, it is disingenuous for Sirius to be asserting, almost two months later, that WCS licensees are not planning to utilize filtering.²⁴ That every WCS licensee, to BellSouth's knowledge, is willing to accept the deployment of as many terrestrial SDARS repeaters operating at power levels up to 400 W/MHz as are necessary to provide adequate coverage speaks volumes as to whether WCS equipment is being properly designed to reject reasonable levels of potentially-interfering signal.

The problem here is not that BellSouth is refusing to utilize appropriate equipment designs, but rather that it is impractical for BellSouth or any other WCS licensee to deploy subscriber equipment capable of rejecting signals from terrestrial DARS repeaters operating at 20 times the standard power level for this part of the spectrum. For example, the developer of one of the systems that BellSouth is currently examining has reported that the cavity duplexer or waveguide diplexer filters necessary to reduce the level of blanketing interference from a 40 kW DARS repeater to that level which would be caused by a standard power (400 W/MHz) repeater would cost approximately \$1,500 in quantity per transceiver (not including developmental costs) and that such filters would be so large as to be impractical for consumer applications (approximately 12 inches by 12 inches, by 6 inches). Given that BellSouth contemplates

²⁰ See Sirius Letter at 4.

²¹ See Harter Statement at Exhibit 1.

²² BellSouth vigorously objects to the assertion by Sirius that at a prior meeting no WCS engineer "could explain why the free space loss model was appropriate to estimate interference with respect to satellite DARS terrestrial repeaters. . . ." See Sirius Letter at 4. While Sirius' counsel may not have understood the answer, one was given. To avoid any confusion, and as is discussed in detail in the Harter Statement, use of a free space model is appropriate where, as here, it is probable that WCS receivers will be mounted at sufficient heights that there will be direct line of sight between the WCS reception antenna and the terrestrial DARS repeater.

²³ *Id.* at 2 (emphasis omitted).

²⁴ Compare Tehan Memorandum at 1 with Sirius Letter at 2.

using WCS as a consumer service, a requirement to use such large, expensive filters effectively destroys WCS. No amount of rhetoric from Sirius can alter the fact that the blanketing interference WCS will suffer under the SDARS-proposed rules is the result of XM and Sirius insisting on power levels more than 20 times greater than the standard for this part of the spectrum.

Although Sirius suggests that “interference from adjacent terrestrial repeaters should have – and easily could have – been avoided by the WCS licensees through compliance with existing rules,” Sirius has yet to point to a single rule the WCS licensees have failed to comply with.²⁵ That is not surprising since BellSouth and, to BellSouth’s knowledge, every WCS licensee is in full compliance with the Commission’s rules regarding design of WCS equipment. Again, the real problem here is not that WCS has failed to comply with the rules, it is that Sirius and XM have prematurely designed and constructed terrestrial repeaters operating at 20 times the power of neighboring services before the adoption of final service rules permitting such power levels.

Finally, it is time to put to rest Sirius’ novel argument that merely because Sirius and XM advised the Commission that they hoped to deploy terrestrial repeaters operating at up to 40 kW, WCS licensees should have altered their business and technology plans to adjust to Sirius’ and XM’s desires. Of course, Sirius’ current posture cannot be squared with its prior acknowledgement that it could not finalize its terrestrial repeater system engineering until the Commission adopted final rules specifying the terms of licensing and operation.²⁶ And, it ignores the fact that the deployment plans for terrestrial SDARS repeaters have been a constantly moving target. For example, in December 1999, XM advised the Commission that it intended to deploy only 25 repeaters with EIRPs in the 20 kW to 40 kW range.²⁷ Yet, XM’s most recent proposed rules would allow each of the SDARS licensees to install at least 250 repeaters operating at up to 40 kW, and even more through a coordination process that unfairly benefits the SDARS licensees to the detriment of WCS.²⁸ And, while XM once represented that its high-power repeaters

²⁵ Sirius Letter at 3.

²⁶ Letter from Robert D. Briskman to Rosalee Chiara, IB Docket No. 95-91, at 2 n.1 (dated Nov. 14, 1997) (“Detailed site engineering has not been completed: CD Radio is awaiting the FCC *Report and Order* so that it can comply with any regulatory requirements.”).

²⁷ See XM December 17, 1999 Supplement at App. A, p. 5 (discussing proposal to operate repeaters with two carriers and EIRP levels of 10 kW to 20 kW per carrier).

²⁸ See XM Letter at Exhibit 1. The coordination process proposed by XM is patently unfair to WCS. Although WCS licensees have until the tenth anniversary of their license to construct facilities under Section 27.14 of the Commission’s Rules, XM’s coordination process would permit the installation of a high-power SDARS repeater in any area without current WCS service as of right, without any regard to whether that repeater would preclude future use of the WCS spectrum. Sirius has proposed a similarly-skewed coordination process. See Sirius Letter at Exhibit 1. Moreover, as discussed in more detail in the

would be located “only in remote and isolated locations containing minimal population,”²⁹ it subsequently submitted information showing that it plans to deploy high-power boosters in the heart of major metropolitan areas (32 repeaters operating between 12 and 31.7 kW in the Boston metropolitan area alone).³⁰ BellSouth is frustrated by the refusal of the SDARS licensees to advance a consistent approach on repeaters, particularly since XM and Sirius assert that WCS licensees somehow were derelict in failing to design around this ever-moving target.

Most importantly, Sirius overlooks the fact that it is the Commission, and not Sirius and XM, that will set the rules governing terrestrial repeaters. The Commission must set those rules based not only on what Sirius and XM want, but on what is necessary to protect the public interest in interference-free WCS services. To the extent that Sirius and XM have jumped the gun and designed and built terrestrial facilities while the *FNPRM* is pending, they have done so at their own risk.³¹

In conclusion, when one puts aside the hyperbole of the SDARS licensees and focuses on the record, it is clear that: (1) WCS licensees are acting reasonably in designing their facilities to operate in the presence of potentially interfering signals in neighboring spectrum, so long as those signals comport with, in XM’s own words, the standard power level in this part of the spectrum; (2) the SDARS licensees can provide

Harter Statement, the proposed coordination process, while focusing on blanketing interference to WCS base stations, ignores the more likely problem of blanketing interference to WCS subscriber units.

²⁹ XM December 17, 1999 Supplement, App. A p. 5. Similarly, while Sirius was last year representing to the Commission that it would deploy 105 high-power repeaters, the rules it proposed recently would permit it to deploy 150 high-power boosters as of right, and an unlimited number of additional repeaters under a coordination process skewed to benefit the SDARS licensees. Compare Sirius January 18, 2001 Supplement at 3 with Sirius Letter at Exhibit 1.

³⁰ An engineering analysis of those repeaters was provided to the Commission by WCA, which established that deployment would have a substantial adverse impact on WCS in the Boston area. See Harter, “Technical Analysis of the Potential for Interference From DARS Terrestrial Repeater to WCS and MMDS/ITFS Services,” annexed to Letter from Paul J. Sinderbrand to Magalie Roman Salas, IB Docket No. 95-91 (filed Dec. 15, 2000). While XM has subsequently suggested that the Boston market is “an anomaly,” it has not disclosed sufficient information from which BellSouth can make an independent assessment of that claim. Certainly, XM’s proposed rule would not preclude it from installing 32 or more high-power boosters in any market, particularly if it can do so before any WCS build-out would require prior coordination.

³¹ At a January 11, 2001 meeting sponsored by the Commission, the SDARS licensees agreed to provide the WCS community with the location and technical parameters of all 255 high-power repeaters they claimed were constructed or planned. That information still has not been provided, although the WCS community has subsequently repeated its request. BellSouth renews its call for full disclosure of that information. Although BellSouth has previously signaled a willingness to consider the possibility of grandfathering existing SDARS terrestrial repeaters with EIRP levels in excess of 400 W/MHz located in areas removed from likely WCS subscriber locations, BellSouth is unable to consider such relief until it knows precisely the location and technical parameters of the existing high-power facilities.

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terrestrial service utilizing repeaters that operate at the standard power level; and (3) allowing terrestrial repeaters to operate at up to 20 times the standard power level as proposed by XM and Sirius will have serious adverse consequences on the ability of WCS licensees to serve the public with the spectrum they acquired at auction or in the secondary market. Based on this record, the Commission should adopt rules that do not compromise the rights acquired at auction by BellSouth and that do not, as advocated by the SDARS licensees, effectively render WCS a secondary service in its own band.

Respectfully submitted,

/s/ Karen B. Possner

Attachment

cc: Ron Repasi
Rockie Patterson
Chris Murphy
Rosalee Chiara
Thomas S. Tycz
Thomas P. Stanley
Bruce Romano
Julius Knapp
James Schlichting
Ronald Netro
John O'Connor
Carl Frank
Bruce Jacobs

Engineering Statement of George W. Harter

Introduction

This statement is prepared on behalf of BellSouth Entertainment Systems ("BES"), a WCS license holder, in response to certain issues raised by the SDARS licensees regarding the use of in-band terrestrial repeaters.

Propagation Model

In a meeting held on March 1, 2001 engineers representing the SDARS licensees, WCS licensees and WCAI industry association met to discuss the issues regarding potential interference between SDARS terrestrial repeaters and WCS receivers. In this meeting it was revealed that the SDARS engineers were analyzing potential interference to WCS receivers based on (1) receive antenna heights very near ground level (<10' AGL) and (2) the dB Planner software package. The dB Planner software was configured to utilize a propagation model developed by the Canadian Research Center ("CRC".) This model incorporated the use of clutter data in making coverage calculations.

In this same meeting it was clearly explained to the SDARS engineers that utilization of these receive antenna heights and this propagation model were not appropriate for analyzing interference to fixed wireless systems like those planned for the WCS band. First, it should be intuitively obvious that fixed wireless system antenna heights can and will be significantly greater than ground level. Fixed wireless antenna heights can vary significantly depending on the size of the home or building where the antenna is mounted. In addition, WCS antennas may even be mounted in trees as is the case in many MDS/ITFS installations. Information has been provided in ex parte filings by WCS operators participating in this proceeding showing the range of heights experienced in current systems. Since many of the technologies currently utilized by WCS operators require line-of-sight (LOS) conditions, achieving the maximum possible height at a receive site is very desirable. Since the SDARS repeater sites are proposing heights at or above current WCS transmission sites, it is very reasonable and prudent to assume that a large number of WCS receive sites will have LOS to SDARS repeater sites.

Second, since the WCS receive sites will have LOS conditions to SDARS repeater sites, the appropriate propagation model to be used is a free-space model. The CRC model incorporates the use of clutter in order to allow a potential operator to generate a less conservative look at coverage from a wireless system. This will allow the operator to estimate worst case conditions in determining the number of base stations needed to provide coverage to an area. However, when running interference calculations to other wireless systems

controlled by another operator, a more conservative approach needs to be taken to the analysis in order to provide adequate protection and not coverage. The free-space model provides the necessary conservatism.

The FCC has long recognized the need to use a free-space model for predicting interference in other similar fixed services. Parts 21 and 74 of the Commission's rules deal with MDS and ITFS services just above and below the WCS frequencies. In calculating interference, a free-space model is used with the addition of a reflection and multiple diffraction component caused by terrain blockage, not clutter data. Likewise, part 101 of the Commission's rules specifies methodologies for interference protection of point-to-point microwave links across multiple bands. Part 101 references TIA Bulletin TSB 10-F as the guide for determining interference calculation and protection. TSB 10-F recommends using free-space calculations where elevation and separation distances result in LOS conditions.

Because of the potentially wide range of WCS receive antenna heights and the ability to locate WCS receive sites anywhere throughout a licensed coverage area, a conservative approach to interference protection must be developed. The only method with sufficient conservatism to protect a WCS licensee's ability to provide service throughout his coverage area is the free-space model.

Overload Interference Area

The size of the area around each SDARS repeater where a BellSouth receiver could receive overload interference is potentially large. There are two equipment vendors under evaluation by BellSouth for use in the WCS band. The overload points for each of the vendor's current products is -27 and -35 dBm respectively. These specifications are at the input to the WCS receiver. A typical WCS installation will utilize an antenna gain of 18 dBi. The required separation distance between an SDARS terrestrial repeater and a WCS receiver for interference protection can now be calculated. For the -27 dBm receiver, the separation distance would need to be 7.2 miles at 40 kwatts of SDARS power and 1.6 miles for a 2 kwatt SDARS repeater. For the -35 dBm receiver, the required separation distance is 18 miles for 40 kwatts and 4 miles for a 2 kwatt repeater. Obviously the potential for interference is large no matter which power level is chosen for SDARS. However, the size of the area and the magnitude of the interference is significantly reduced when the power is limited to 2 kwatts.

SDARS Service Areas

The SDARS licensees have not submitted sufficient technical analyses justifying their need for the exorbitant power levels being requested. In a recent ex parte filing, AT&T Wireless conducted an analysis of the expected difference in coverage areas between a 2 kwatt and a 40 kwatt SDARS repeater. The

analysis utilized the propagation model and software recommended by the SDARS licensees for these types of analyzes. The studies showed conclusively that increasing the power from 2 kwatts to 40 kwatts does not grow the coverage area of the repeaters significantly. In fact, the 2 kwatt design with the addition of only a few more repeaters provided just as effective a coverage area as the 40 kwatt design.

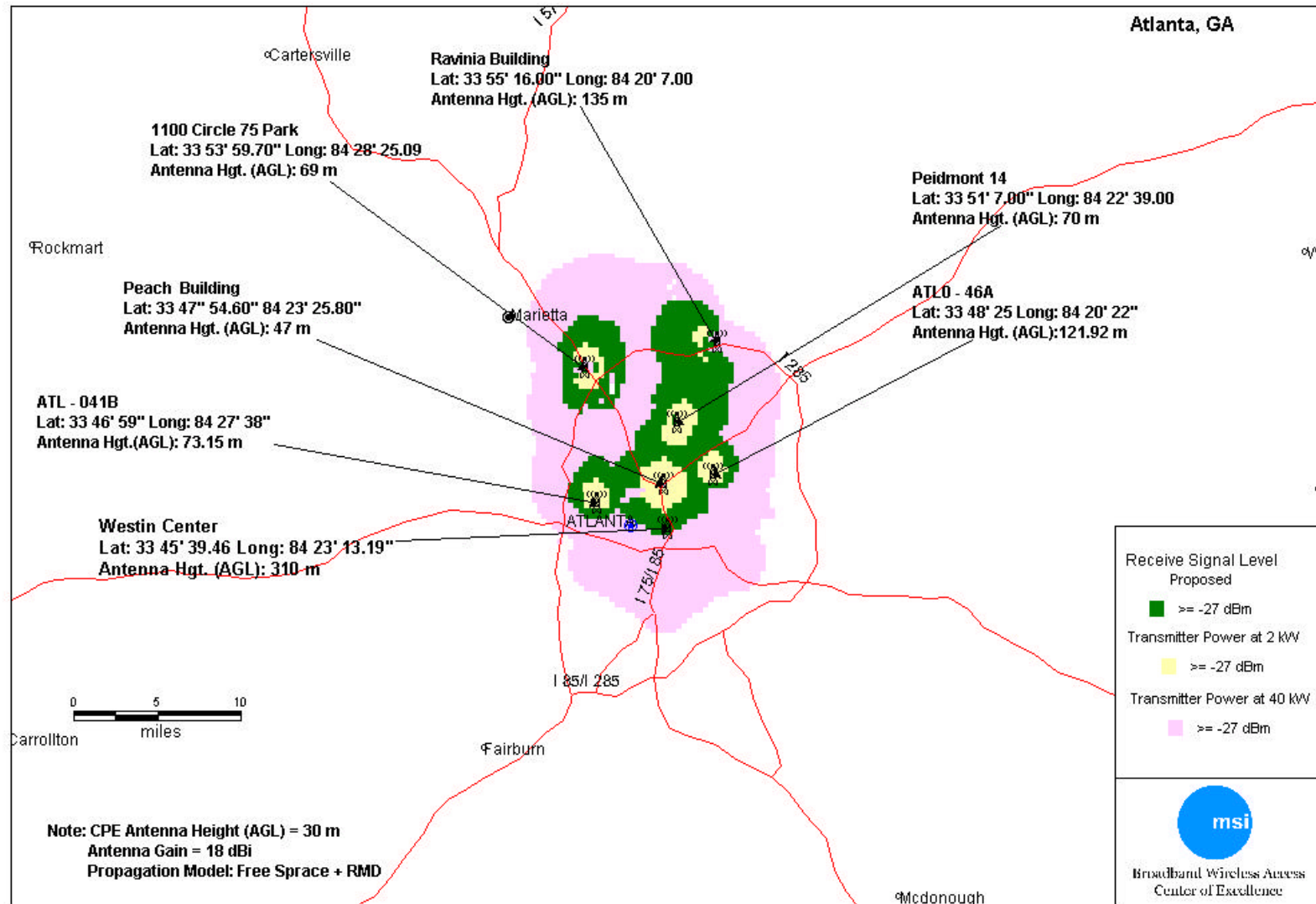
In addition, attached as Exhibit 1 are two studies performed using a similar software package to that utilized by AT&T and the SDARS licensees. These studies are different from the AT&T studies in that (1) the receive antenna height has been increased to 30 meters above ground level, (2) the overload point has been changed to -27 and -35 dBm respectively for the BellSouth chosen equipment, (3) the gain of the receive antenna is 18 dBi and (4) a free-space propagation model has been utilized. This model also incorporates an RMD component (reflection plus multiple diffraction) so that additional attenuation caused by terrain variations will be incorporated. As these studies clearly show, the potential area of overload interference to BellSouth subscriber units covers essentially the entire metropolitan area when 40 kW is utilized.

Rules Proposed by SDARS Licensees

In the latest ex parte submissions by Sirius and XM, the SDARS licensees have proposed certain rule changes in part 25 dealing with terrestrial repeaters. Both licensees have proposed some form of limited coordination between SDARS terrestrial repeaters and WCS base station receivers. However, the issue of WCS subscriber receivers has been totally ignored. The protection of WCS subscriber receivers is the crucial issue as these receivers can be at significantly different heights and a multitude of locations throughout a service area. The probability of a WCS subscriber receiver coming in close proximity to an SDARS repeater is much higher than a WCS base station receiver. There is no way to coordinate an SDARS repeater and the multitude of possible locations for WCS subscriber receivers. The only way to adequately protect WCS subscriber receivers is to provide reasonable power limitations on the SDARS repeaters such that WCS receivers have the ability to reject the interfering carriers with reasonable levels of filtering. This is practical when the SDARS emissions are limited in power to the same levels as other WCS licensees.

Exhibit 1

Receive Signal Level Analysis



Receive Signal Level Analysis

